

WHAT IS CLAIMED IS:

1. A novel isoflavone-phospholipid molecular complex.
- 5 2. A complex according to Claim 1, wherein the complex is formed by the method, comprising: co-processing raw phospholipid materials with isoflavone-rich plant materials, wherein the raw phospholipid materials are obtained from vegetable sources, animal sources, or a combination thereof and the isoflavone-rich plant materials are extracted from a vegetable source.
- 10 3. A complex according to Claim 2, wherein the raw phospholipid material is selected from: soy gum, soy lecithin, deoiled soy lecithin, sunflower lecithin, deoiled sunflower lecithin, egg lecithin, deoiled egg lecithin, egg yolk, brain lecithin, and deoiled brain lecithin and the starting isoflavone-rich plant material is at least one material selected from: soybean, full-fat soy flour, partially-defatted soy flour, and defatted soy flour, soy isoflavones concentrate, red clover isoflavones concentrate, and soy grits.
- 15 4. A complex according to Claim 3, wherein the raw phospholipid material is selected from the group: soy gum and soy lecithin and the starting isoflavone-rich plant material is soy flour.
- 20 5. A complex according to Claim 2, wherein the phospholipid concentration in the raw phospholipid materials is from about 0.1-98%, by weight and the isoflavone concentration in the starting isoflavone-rich plant material is from about 0.1-80%, by weight.
- 25 6. A method of preparing isoflavone-phospholipid molecular complexes, comprising: (a) mixing raw phospholipid materials and isoflavone-rich plant materials, (b) contacting the mixture with an alcohol to extract the complexes, and (c) filtering.

7. A method according to Claim 6, further comprising: (d) drying the filtrate.
 8. A method according to Claim 6, further comprising: (a₁) hydrating the resulting mixture from (a) with about 1-25% water w/w prior to performing (b).
 9. A method according to Claim 6, further comprising (a₂) heat-treating the mixture from (a) at a temperature of about 100-200°C for about 10-180 minutes, prior to performing (b).
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10. A method according to Claim 9, wherein the heat-treating is performed at about 170°C.
 11. A method according to Claim 9, wherein heat-treated mixture is cooled to about 40-60°C prior to performing (b).
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12. A method according to Claim 6, wherein (b) is performed by contacting the resulting mixture with an alcohol selected from: methyl alcohol, ethyl alcohol, and isopropyl alcohol.
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13. A method according to Claim 12, wherein the alcohol is aqueous ethyl alcohol in an alcohol to water range of about 60:40 to 100:0, v/v.
 14. A method according to Claim 6, wherein (c) is performed via an ultrafiltration with a membrane having a MWCO of about 10,000 to 1,000,000.
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15. A method according to Claim 14, wherein the membrane has a MWCO of about 150,000.

16. A method according to Claim 14, wherein a centrifugation or filtration is performed prior to the ultrafiltration.
- 5 17. A method according to Claim 16, wherein the centrifugation is performed at a rate of about 2500 rpm for about 15 minutes.
- 10 18. A method according to Claim 16, wherein the filtration material is in the range of 85-100 g/m².
- 15 19. A method according to Claim 16, wherein a microfiltration is performed after the centrifugation or filtration, but before the ultrafiltration, wherein the microfiltration is performed using a membrane with a pore diameter of about 0.2-1 μ.
- 20 20. A method according to Claim 6, further comprising: (c₁) removing the alcohol portion of the filtrate resulting from ultrafiltration.
- 25 21. A method according to Claim 20, further comprising: (e) hydrating the residue after alcohol and (e₁) passing the resulting solution through an adsorptive resin.
- 30 22. A method according to Claim 21, wherein the adsorptive resin is selected from: ethylvinylbenzene-divinylbenzene copolymer, non-ionic styrene-divinylbenzene copolymer; ionic polystyrene; non-ionic polystyrene; nonionic ethylvinylbenzene-divinylbenzene copolymer; and ionic styrene-divinylbenzene copolymer.
23. A method according to Claim 22, wherein the adsorptive resin is XAD16 divinyl benzene copolymer resin.
24. A method according to Claim 21, further comprising: (e₂) washing the adsorptive resin with water after completion of procedure (e₁).

25. A method according to Claim 24, wherein the water washing is performed with
water at a temperature of about 45°C.
- 5 26. A method according to Claim 24, further comprising: (e₃) washing the adsorptive
resin with an aqueous alcohol the water wash of (e₂).
- 10 27. A method according to Claim 26, wherein the alcohol washing is performed with
aqueous ethyl alcohol at a temperature of about 30-70°C, the aqueous ethyl
alcohol solution being about 70-100% ethyl alcohol by volume.
- 15 28. A novel food ingredient, dietary supplement, cosmetic, or pharmaceutical
composition, comprising: an isoflavone-phospholipid molecular complex
according to Claim 1.
29. A composition according to Claim 28, wherein about 0.1-3000 mg of the complex
are administered daily.
- 20 30. A composition according to Claim 29, wherein about 1-500 mg of the complex
are administered daily.
31. A method of treating a disease, comprising: administering a therapeutically
effective amount of an isoflavone-phospholipid molecular complex according to
Claim 1 to a patient in need thereof, wherein the disease is selected from:
25 premenstrual syndrome, including fluid retention, cyclical mastalgia, and
dysmenorrhoea; menopausal syndrome including hot flushes, anxiety, depression,
headaches, mood swings, night sweats, and urinary incontinence; Buergers
Disease; Reynaud's Syndrome; Reynaud's Phenomenon; angina pectoris;
coronary artery spasm; migraine headaches; hypertension; benign prostatic
30 hypertrophy; breast cancer; endometrial cancer; large bowel cancer; ovarian

- cancer; prostatic cancer; testicular cancer; uterine cancer; atherosclerosis;
Alzheimers disease; dementia; cognitive dysfunction; inflammatory diseases
including inflammatory bowel disease, Crohns disease, ulcerative colitis;
alcoholemia; cirrhosis; delirium tremens; osteoporosis; rheumatic diseases
including rheumatoid arthritis; acne; baldness including male pattern baldness
(alopecia hereditaria); psoriasis and diseases associated with oxidant stress
including cancer, myocardial infarction stroke, arthritis, sunlight induced skin
damage, and cataracts.
- 10 32. A method of treating or reducing the predisposition to symptoms associated with
a disease, comprising: administering a therapeutically effective amount of an
isoflavone-phospholipid molecular complex according to Claim 1 to a patient in
need thereof, wherein the disease is selected from: menopause, cancer,
15 Alzheimer's disease, atherosclerosis, hypercholesterolemia, dementia, cognitive
dysfunction, osteoporosis, pre-menstrual syndrome, prostate diseases, and
alcoholemia.